RHIC Physics fy05 Run
Daily Quench Analysis for the month of June 2005

***Wednesday-June 01, 2005*: PR-138, Yellow Quench: File# = 1117621134**
Permit ID: **4b-time.B** Timestamp: **06:18:52 +2990333** Beam Permit Fail Timestamp: **04:57:20 +1813544**
QPAControl / Timing Resolver: No faults indicated, Yellow Permit Module QLO first to trip.
Main Power Supply TR: Yellow Quad Flattop first indication.
Quench Detector(s) Trip: All systems running.
5 Minute: Quench Delay File: None Initiated, all systems running.
Beam Loss Monitors (Rads/Hr): No Beam In the Machine.
Main Magnet Power Status: Yellow Dipole according to the Postmortems shows that it was ramping past Park towards Injection current, tripping off near 60 amps. Yellow Quad supply was in the off state, while the Iref and wfg had been ramping also in the similar condition as the dipole. Tape was therefore user invoked cancelled at 06:22:52.
Yellow Quad Main Power Supply was tripped on Regulator Fault

Technical Notes / Sequence of Events: In extensive discussions with Carl, it is still undetermined as to the reason why the Yellow Quad Power Supply encountered a Regulator Error Fault. There is some leaning towards a brief power interruption within the control circuits that operate the Regulator. Investigation is still on going as of this writing. *G. Heppner*

Physics / MCR Logs: Jun-01-2005 06:23 Yellow quenched while ramping to injection. Don is checking. -Sanjee
Jun-01-2005 06:31 it looks like this QLI was caused by a regulator error from the yellow quad main p.s. This shows up in the automatic analysis program above next to occ Ctrl. y-qmain-status: Reg Err. -Don Bruno [yellow] [ps]
06:35 Yellow quench was caused by a regulator error in the main power supplies. Don notes that the error should clear by the quench recovery script. If the script fails to clear the error, we were asked to contact Carl Schultheiss.

QLI Recovery TAPE Start: **06:20:17 (user invoked, Yellow Dipole setpoint was at Injection current)**
QLI Recovery TAPE Start: **06:28:56** Link Recovered Time: **06:40:25** Estimated Down Time: **19** minutes
Quench Analysis: Yellow Main Quad Power Supply – Regulator Error.
(Counter = Mains y-qmain)

RHIC Physics fy05 Run
Daily Quench Analysis for the month of June 2005

Thursday-June 02, 2005: PR-139, Blue Quench: File# = 1117753415

Permit ID: **4b-time.A** Timestamp: **19:03:32 +3452220** Beam Permit Fail Timestamp: **19:03:32 +3452221**
QPAControl / Timing Resolver: No faults indicated, QP04-R4BQDF1-b4-q89-qp first to trip.
Quench Detector(s) Trip: All tripped indicating Positive Tq Values.
5 Minute: Quench Delay File: None indicated, All Systems Running.
DX Heaters: None fired.
Beam Loss Monitors (Rads/Hr): Beam Aborted as should in Sector 9 and 10.
Main Magnet Power Status: At Store Current for 205Gev Run: BDMC = 4041.56 amps, BQMC = 3840.65 amps
There was an indication of b-dmain, Current Monitor Alarm.

Technical Notes / Sequence of Events: Qdplots indicated that the supply, while at operating current of -266.26 amps suddenly went to -138 amps for approximately 3.4 seconds before failing. Trip indication was Stby-Error. *G. Heppner*

Physics / MCR Logs: 19:48 I think this p.s. will have to be swapped out. I asked MCR to try one hysteresis ramp first but I think the supply will trip again. I will get CAS ready to swap out the supply. -Don Bruno [blue] [ps]

Cryogenics: Nothing to report.

QLI Recovery TAPE Start: **19:16:07** Link Recovered Time: **19:25:41** Estimated Down Time: **23** minutes

Quench Analysis: b4-q89 power supply tripped to Standby-Error
(Counter = IR Power Supplies)

Thursday-June 02, 2005: PR-140, Blue Quench: File# = 1117756524

Permit ID: **4b-time.A** Timestamp: **19:55:24 +201414** Beam Permit Fail Timestamp: **19:55:24 +201415**
QPAControl / Timing Resolver: No faults indicated, QPAIC-B1, R4BYQF3 Quench Detector first to trip.
Quench Detector(s) Trip: 4b-qd1, B3QDQ8_VT, Int. 5, Tq -23
5 Minute: Quench Delay File: None indicated, All Systems Running.
DX Heaters: None fired.
Beam Loss Monitors (Rads/Hr): No Beam In the Machine.
Main Magnet Power Status: Ramping from Injection to Store, tripping at: BDMC = 1690.54 amps, BQMC = 1626. 83 amps

Technical Notes / Sequence of Events: The 4b-qd1 Quench Detector tripped the link due to a current spike indicated at B3QDQ8_VT. The current dropped at b4-q89-ps and is reflected as seen at bi4-qf9-ps and bo3-qf8-ps as the current bumps at the time q89 current drops. These three supplies are nested together. There was no magnet quenches associated with this trip. *G. Heppner*

Physics / MCR Logs: 20:23, this time the trip was not caused by b4-q89-ps. If I interpret the timing resolver data correctly it may be a loose k-lock connection but I am not sure so I asked Wing Louie to look at it. Joe Drozd is coming in to help CAS swap it out b4-q89 anyway because I still think there is something wrong with this p.s. -Don Bruno [blue] [ps] 20:59 I spoke with Wing and he pointed out to me that one of the Timing Resolvers was not reset after the last QLI. That is why the automatic QLI program came up with its result of a loose k-lock. The quench detector pulled the link because b4-q89 misbehaved again. I will talk to someone in controls and maybe they can help figure out why one of the timing Resolvers was not reset in 4b. -Don Bruno [blue] [ps]

Cryogenics: Nothing to report.

QLI Recovery TAPE Start: **22:13:03** Link Recovered Time: **22:20:57** Estimated Down Time: **146** minutes

Quench Analysis: b4-q89 power supply tripped to Standby-Error
(Counter = IR Power Supplies)

RHIC Physics fy05 Run
Daily Quench Analysis for the month of June 2005

Friday-June 03, 2005: PR-141, Blue Quench: File# = 1117845027

Permit ID: **7b-ps1** Timestamp: **20:30:24 +3250038** Beam Permit Fail Timestamp: **20:17:20 +736389**
QPAControl / Timing Resolver: N/A
Quench Detector(s) Trip: 7b-qd1, B6DSA4_A3VT, Int. 100, Tq -24
5 Minute: Quench Delay File: None indicated, All Systems Running.
DX Heaters: None fired.
Beam Loss Monitors (Rads/Hr): No Beam In the Machine.
Main Magnet Power Status: Ramping down from Store, tripping at: BDMC = 1923.12 amps, BQMC = 1851.41 amps

Technical Notes / Sequence of Events: The wrong slow factor had been used, causing the blue quench detectors to trip the link. *G. Heppner*

Physics / MCR Logs: A Little Bit of Background.
2005-Jun-03 19:00:00 Beam is injected into RHIC for a ramp. 2005-Jun-03 19:07:00 Beam was lost on the ramp. Accumulated loss monitor pulled the permit. 2005-Jun-03 19:20:00 The loss monitor threshold values were not reverted from 205 GeV run. We reverted the values with help from Mei Bai. 2005-Jun-03 20:17:00 Beam was lost on the ramp again due to a loss monitor permit pull. We are investigating along with Mei Bai. 2005-Jun-03 20:33:30 The RF frequencies are not set properly for cogging. Beam was lost at the cogging step stone. We set the frequencies to proper values. Tom Hayes was contacted to confirm. 2005-Jun-03 20:34:23 Both rings quenched on the down ramp. George Ganetis was called at his office to inform and he is investigating. 2005-Jun-03 20:57:08 George notes that the wrong Slowfactor was loaded during the down ramp. We believe that the wrong slow factor must have been loaded when we issued a hard stop to terminate the ramp. We are running the recovery script.
Cryogenics: Nothing to report.

QLI Recovery TAPE Start: **20:46:40** Link Recovered Time: **21:07:15** Estimated Down Time: **38** minutes
Tasked paused due to an error while conducting the ON checks for bo3-qf6-ps, user initiated a retry and it worked
Quench Analysis: WRONG RAMP FACTOR (Off the Hysteresis)
(Counter = Operations Error)

Friday-June 03, 2005: PR-142, Yellow Quench: File# = 1117845029

Permit ID: **1b-ps1** Timestamp: **20:30:28 +1015258** Beam Permit Fail Timestamp: **20:17:20 +736389**
QPAControl / Timing Resolver: N/A
Quench Detector(s) Trip: 1b-qd1, Y12DSA5_A4VT, Int. 100, Tq –23
3b-qd1, Y2DSA5_A4VT, Int. 100, Tq –12
5b-qd1, Y4DSA5_A4VT, Int. 100, Tq –12
7b-qd1, Y6DSA5_A4VT, Int. 100, Tq –23
9b-qd1, Y8DSA5_A4VT, Int. 100, Tq –11
11B-qd1, Y10DSA5_A4VT, Int. 100, Tq -11
5 Minute: Quench Delay File: None indicated, All Systems Running.
Beam Loss Monitors (Rads/Hr): No Beam In the Machine.
Main Magnet Power Status: Ramping down from Store, tripping at: YDMC = 1898.78 amps, YQMC = 1831.55 amps

Technical Notes / Sequence of Events: The wrong slow factor had been used, causing the yellow quench detectors to trip the link. *G. Heppner* (See details above in the Blue PR-141 QLI)

Physics / MCR Logs: Ha! Just realized the frequency is wrong! It is still for 205 GeV -Mei
Cryogenics: Nothing to report.

QLI Recovery TAPE Start: **20:47:23** Link Recovered Time: **21:07:08** Estimated Down Time: **38** minutes
Tasked paused due to an error while conducting the ON checks for yo9-qd7-ps, user initiated a retry and it worked.
Quench Analysis: WRONG RAMP FACTOR (Off the Hysteresis)

(Counter = Operations Error)

Saturday-June 04, 2005: PR-143, Blue Quench: File# = 1117916424

Permit ID: **12a-ps1** Timestamp: **16:20:24 +890766** Beam Permit Fail Timestamp: **16:20:24 +890767**
QPAControl / Timing Resolver: No faults indicated, QP07-R12ABQF5-b12-q7-qp first to trip.
Quench Detector(s) Trip: All tripped indicating Positive Tq Values.
5 Minute: Quench Delay File: None indicated, All Systems Running.
DX Heaters: None fired.
Beam Loss Monitors (Rads/Hr): Beam Aborted as should in Sector 9 and 10.
Main Magnet Power Status: At Store Current, tripping at BDMC = 1946.37, BQMC = 1873.97 amps

Technical Notes / Sequence of Events: (See Physics / MCR Logs below). *G. Heppner*

Physics / MCR Logs: 16:42, the b12-q7 supply will not remotely go into standby. D. Bruno has requested that Support investigate locally. -jak [blue] [ps]

16:56, b12-q7-ps tripped the link because it went to the OFF state. I am asking CAS to reseat connectors on the Housekeeping p.s. -Don Bruno [blue] [ps]
16:57, CAS was able to put b12-q7 into standby locally. I am asking CAS to reseat connectors on the housekeeping p.s. Then I will make sure it goes to standby remotely. -Don Bruno [blue] [ps]
17:20 CAS (Frank and George) reseated the connectors on the housekeeping p.s. I am hoping this will help with the OFF trip problem. Then I found I could not go to standby remotely. They reseated the 25 pin D connector for the node card at the p.s. end. This did not help. Next, they swapped the digital isolation card and that worked. I could go to standby remotely. Then they put the original digital isolation card back in and that worked as well, when it did not work before. I am asking them to put a new digital isolation anyway and we will examine the old card. There could still be another problem on the backplane connector that the digital isolation card plugs into. -Don Bruno [blue] [ps]

Cryogenics: Nothing to report.

QLI Recovery TAPE Start: **16:29:18, step 108 b12-q7-ps OFF, 17:26:58** Link Recovered Time: **17:35:30**
Estimated Down Time: **76** minutes

Quench Analysis: b12-q7 power supply tripped to off.

(Counter = IR Power Supplies)

RHIC Physics fy05 Run
Daily Quench Analysis for the month of June 2005

Scheduled Maintenance Day 0800 to 1630
Wednesday-June 08, 2005: PR-144, Blue and Yellow Quench Files:

File# = 1118232697 Permit ID: **Blue 4b-time.A** Timestamp: **08:11:36 +1377524**
File# = 1118232765 Permit ID: **Yellow 4b-time.A** Timestamp: **08:12:44 +1945445**

Technical Notes / Sequence of Events: All good and well, turned the RHIC Machine back over to MCR. QLI Counters are now activated as of 18:00:00 Hours. *G. Heppner*

RHIC ps Maintenance performed today: 1) Hi-potted rotators and snakes in alcoves 7A, 7C, 9A, and 9C. 2) Confirmed polarity of snakes and rotators was correct after hipot of 7A, 7C, 9A and 9C, using quench detector. 3) Swapped out qpa for bo2-qd3-qp because of fan fault. 4) Swapped out qpa fan switches for b12-dh0-qp because of qpa fan fault. 5) Replaced firing card of b2-dhx-ps. 6) Swapped out buffer card of bi9-dhx-ps. 7) Swapped out current regulator card of yi11-tq5-ps. 8) Swapped out digital isolation card of y12-dh0-ps. 9) Removed bo2-tv7-ps, cleaned dcct pins, and re-installed same ps for bo2-tv7-ps. When the DC cables were re-connected the polarity was re-confirmed visually. 10) Inspected main p.s. OCC remote I/O link for possible problem. All looked good. 11) Replace B2-Q4 thermostat on magnet tree for ice ball prevention. 12) Installed jumpers on the voltage monitor boards at I-01Q1 ,Q2, Q6 and O-01Q1, Q2, Q6. 13) Replaced the broken fan at O-01Q2. 14) The bi9-snk7-2.3-ps has new ramping instructions that MCR is aware of and also Al Marusic. 15) All of the snakes and rotators were ramped up to their operating current and back down again. -Don Bruno [rhic] [ps]

March 31 Blue Recovery TAPE Start: **16:54:6** Link Recovered Time: **17:11:37**
March 31 Yellow Recovery TAPE Start: **14:20:33** Link Recovered Time: **14:28:31**

Quench Analysis: Scheduled Maintenance
(Counter = Maintenance) Weather conditions: Hazy, Hot and Humid 90degrees.

Thursday-June 09, 2005: PR-145, Blue Quench: File# = 1118359632
Permit ID: **11b-ps1** Timestamp: **19:27:12 +766054** Beam Permit Fail Timestamp: **19:27:12 +766057**
QPAControl / Timing Resolver: No faults indicated, Sextupoles remain running.
Quench Detector(s) Trip: 11b-qd1, B10QBA3_A2VT, Int. 100, Tq –23
12a-qd1, B11QFQ6_4VT, Int. 1, Tq –4810628
5 Minute: Quench Delay File: None indicated, All Systems Running.
DX Heaters: None fired.
Beam Loss Monitors (Rads/Hr): Slightly higher levels in Sector 9 Dump but overall no affect on this QLI.
Main Magnet Power Status: Tripping at Store Energy, BDMC = 1946.38 amps, BQMC = 1873.99 amps

Technical Notes / Sequence of Events: B10QBA3_A2VT caused the Quench Detector to trip the link. The Reading was much greater then compared to a normal set. It was –0.034 compared to -0.002 and also appears to be noisy. *G. Heppner*

Physics / MCR Logs: Unexplained as to the cause, leaning towards the blue abort kicker.

Cryogenics: Nothing to report.

QLI Recovery TAPE Start: **19:51:35** Link Recovered Time: **19:59:49** Estimated Down Time: **33** minutes

Quench Analysis: 11b-qd1 Quench Detector Loose Connection of V-Tap wire.

(Counter = Quench Detector)

Friday-June 10, 2005: PR-146, Blue Quench: File# = 1118386455

Permit ID: **8b-ps1** Timestamp: **02:54:12 +3558071** Beam Permit Fail Timestamp: **02:47:12 +2466130**
QPAControl / Timing Resolver: B01 first, no faults indicated. (Permit Module)
Quench Detector(s) Trip: 2b-qd1, B2DRDX_VT, Int. 5, Tq –23, 4b-qd1, B4DRDX_VT, Int. 5, Tq –23, 6b-qd1, B6DRDX_VT, Int. 5, Tq –23, 8b-qd1, B8DRDX_VT, Int. 5, Tq –23, 10a-qd1, B10DRDX_VT, Int. 5, Tq –12, 12a-qd1, B12DRDX_VT, Int. 5, Tq –44121920
5 Minute: Quench Delay File: None indicated, All Systems Running.
DX Heaters: None fired.
Beam Loss Monitors (Rads/Hr): Beam was aborted prior to this event.
Main Magnet Power Status: While ramping to Park Current and arriving there, the Blue Main Dipole suddenly ramps back up, leveling at 180amps prior to tripping.

Technical Notes / Sequence of Events: Talking to Carl Schultheiss, the explanation as to this sudden change in current when the supply was told not to needs further investigation. He believes this is within the Main Power Supplies Control System. The sudden increase in current di/dt = 7 amps per second was to great of an increase for the DX Magnets in which the DX Magnet Quench Detectors detected and pulled the link. *G. Heppner*

Physics / MCR Logs: 02:56 Blue main dipole goes crazy, Blue Quench alarm comes in as well, but no beam?? -BSB
02:58 Blue quench indicators galore. -JLN
02:59 dx heaters lose communication in 4'oclock? -JLN
03:02 *fit* reports that 4b-ps4 is hung. We will reset the FEC. -LH
03:06 qpaCtril_4b seems to be having troubles... -JLN

Cryogenics: Nothing to report.

QLI Recovery TAPE Start: **03:12:06** Link Recovered Time: **03:21:42** Estimated Down Time: **28** minutes

Quench Analysis: Blue Main Dipole Power Supply unexplained current ramp from park.
(Counter = Blue Main Dipole PS)

Friday-June 10, 2005: SQ-010; Snake Quench Identified, 3C, File# BAS.118400635

Beam Permit, Link Status, Permit.3c-ps1 = 06:50:32 +3296618
Snake Quench Permit.3c-ps1 = 06:50:32 +3296578

Operating Currents Qdplots / Snapshot Trip Time:
Snapshot Time: bo3-snk7-1.4-ps, 06:50:35 (100.03 amps), Last Commands all indicate ON
QPAControl / Timing Resolver: No faults indicated, Quench Detector bit 7 first to initiate.
Beam Loss Monitors (Rads/Hr): b3-lm7.2-snk = 30.55 peak, b3-lm7.1-snk = 8.41 peak
Qdplots: Blue Aux 4, signals: BO3SNK7_4IC-4OC, Int. 1
Ground Currents: Bo3-snk7-1.4 = 0.000132 amps/peak
Magnet quench: Real

Technical Notes / Sequence of Events: Operating at 100.03 amps, current drops suddenly to 97.36 amps. This sudden change in current is what caused the 3c-qd1 quench detector to trip. Seen before, it is still undetermined as to why the sudden drop in current. *G. Heppner*

Physics / MCR Logs:

Cryogenics Log April 23, 2005: 07:13 Power dip QLI snake 3:00 –mm

QLI Recovery TAPE Start: **07:31:21** Link Recovered Time: **07:31:59** Estimated Down Time: **52** minutes

Quench Analysis: Undetermined
(Counter =Other)

***Friday-June 10, 2005*: PR-147, Blue Quench: File# = 1118425630**
Permit ID: **4b-time.A** Timestamp: **13:47:08 +2812151** Beam Permit Fail Timestamp: **13:17:56, 113037**
QPAControl / Timing Resolver: Permit module first to trip (b-PM-QLI, B01)
Quench Detector(s) Trip: No indications, all data lines in blue but all systems running.
5 Minute: Quench Delay File: None indicated, All Systems Running.
DX Heaters: None fired.
Beam Loss Monitors (Rads/Hr): No beam in the machine.
Main Magnet Power Status: At Zero Current.

***Friday-June 10, 2005*: PR-147, Yellow Quench: File# = 1118425630**
Permit ID: **4b-time.A** Timestamp: **13:47:08 +2817276** Beam Permit Fail Timestamp: **13:17:56, 113037**
QPAControl / Timing Resolver: Permit module first to trip (y-PM-QLI, Y01)
Quench Detector(s) Trip: No indications, all data lines in blue but all systems running.
5 Minute: Quench Delay File: None indicated, All Systems Running.
Beam Loss Monitors (Rads/Hr): No beam in the machine.
Main Magnet Power Status: At Zero Current.

Technical Notes / Sequence of Events: (See Physics / MCR Log below for cause) *G. Heppner*

Physics / MCR Logs: 13:15 Beam aborted by loss monitor permit pull in 8b-ps1. Turning off critical device for accesses: STAR requires time in their IR, vacuum personnel are going to revive the g5 ion pump, G Heppner will go in for a circuit breaker reset and controls hardware personnel need to replace the utility module for 6b-ps1. 13:55, this is due to work on the 6b-ps1 FEC. -gjm
Cryogenics: Nothing to report.

Blue QLI Recovery TAPE Start: **13:57:28** Link Recovered Time: **14:05:40** Estimated Down Time: **19** minutes
Yell QLI Recovery TAPE Start: **14:05:50** Link Recovered Time: **14:13:22** Estimated Down Time: **27** minutes

Quench Analysis: Controls Related work on failed 6b-ps1-fec
(Counter = Controls Related 6b)

***Friday-June 10, 2005*: PR-148, Blue Quench: File# = 1118428455**
Permit ID: **11b-ps1** Timestamp: **14:34:12 +3747965** Beam Permit Fail Timestamp: **13:17:56, 113037**
QPAControl / Timing Resolver: No faults indicated, Sextupoles remain running.
Quench Detector(s) Trip: 11b-qd1, B10QBA3_A2VT, Int. 100, Tq –23
5 Minute: Quench Delay File: 6b-qd1, Finished deferred dump, all others running.
DX Heaters: None fired.
Beam Loss Monitors (Rads/Hr): No Beam in the Machine.
Main Magnet Power Status: Tripping at Store Energy, BDMC = 1946.38 amps, BQMC = 1873.99 amps

Technical Notes / Sequence of Events: B10QBA3_A2VT caused the Quench Detector to trip the link. This time it was pretty evident as the voltage tap signal begins to fail at –15 seconds prior to the T = zero. (See Findings below in the Physics / MCR Logs Comment) *G. Heppner*

Physics / MCR Logs: 14:35 Blue QLI during hysteresis ramp at 11b-ps1. 14:43 after reviewing the quench log data George would like to enter 11b and look at the voltage taps. He is coming to MCR for a key. 15:04 STAR, power supply and vacuum entries complete. G Ganetis and W Louie are accessing the ring. 15:54 Wing and George found a loose connection on a terminal block. Restoring systems.
Cryogenics: Nothing to report.

QLI Recovery TAPE Start: **15:57:20** Link Recovered Time: **16:06:52** Estimated Down Time: **93** minutes

Quench Analysis: 11b-qd1 Quench Detector Loose Connection of V-Tap wire.
(Counter = Quench Detector)

***Sunday-June 12, 2005:* SQ-011; Snake Quench Identified, 3C, File# BAS.1118589535**
Beam Permit, Link Status, Permit.3c-ps1 = 11:18:52 +3979237
Snake Quench Permit.3c-ps1 = 11:18:52 +3979197

Operating Currents Qdplots / Snapshot Trip Time:
NOTE: The only data available is Qdplots.

YI3SNK7R2_GL Int. 1 (Quenched due to Cryo)
Yi3-snk7-2.3-ps = 322.749 amps (Real Quench)
Yi3-snk7-1.4-ps = 97.840 amps V-taps see warm gas –5.4 seconds before T=zero.

BO3SNK7R3_GL, Int. 1 (Quenched due to Cryo)
Bo3-snk7-2.3-ps = 323.186 amps (Real Quench)
Bo3-snk7-1.4-ps = 100.048 amps (Perturbation seen at –2.633 seconds)

Beam Loss Monitors (Rads/Hr): No Snapshot or Postmortem Data available

Physics / MCR Logs: 11:50 acnlin84 which hosts the main servers went down at 10:50 this morning. All the computers in MCR halted operation. We found the home numbers for Roger Katz & Charlie Whalen from the white pages of telephone book. Roger is on his way in. acnlin84 was rebooted with the help from Charlie. The computers in MCR are working. Both RHIC rings quenched. Cryo has lost control and readback data from several systems.

Cryogenics Log: At 10:49 MCR lost server, we had to put all lead flows into man and set for tare flow. Lost recoolers and circ pump flow dropped below limit. Server reset and system recovering from quench. All flow controllers back in auto. -yatauro
13:24 Called MCR told them everything is good here and that they could ramp. -yatauro
14:25 Alarms: looks like a quench in Blue 8/9. Temps are up and the circ flow dropped to 20 -yatauro
18:05 System stable, other then the server going down, everything else running fine. -yatauro

Technical Notes / Sequence of Events: There was enough data that clearly shows that lead faults on the snakes in sector 3 quenched both blue and yellow snakes. The warm gas form these snake quenches quenched the main bus for both blue and yellow rings. Data also shows that the lead flow was increased for a short time before it went to a low level.

This is what I believed happened. The lead current data from the Cryo server went down. The lead flow automatically goes to a high flow default value. The Cryo operators then brought the lead flow to a low value. This was in their Cryo e-log. This is what caused the snakes to have a lead fault. They should not have done this with current in the magnet. Some how the Cryo operators did not know the machine was a top energy and or MCR did not know it either. George Ganetis

TAPE Start: **13:38:01** Last Snake to ON: **13:43:15** Estimated Down Time: **144** minutes

Quench Analysis: Cryo Induced Quench, Sector 3C
(Counter = Cryo Induced Snake)

SQ-011 then causes Buss Quenches in both Rings.
(See next page Yellow PR-149 and Blue PR-150)

Sunday-June 12, 2005: PR-149, Yellow Quench: File# = 1118589537

Permit ID: **4b-time.A** Timestamp: **11:18:56 +1246335** Beam Permit Fail Timestamp: **11:18:52 +3979201**
(3b-ps1 in the PINK = Loss of Communication)
QPAControl / Timing Resolver: No faults indicated, Yellow Permit Module QLO first to trip.
Quench Detector(s) Trip: 4b-qd2, Y3QDQ8_VT, Int. 20, Tq –23
5 Minute: Quench Delay File: None Initiated, all systems running.
Beam Loss Monitors (Rads/Hr): No Postmortem / Snapshot Data Available.
Main Magnet Power Status: At Store Energy, tripping at: YDMC = 1946.42 amps, YQMC = 1876.70 amps

Physics / MCR Logs: 11:50 acnlin84 which hosts the main servers went down at 10:50 this morning. All the computers in MCR halted operation. We found the home numbers for Roger Katz & Charlie Whalen from the white pages of telephone book. Roger is on his way in. acnlin84 was rebooted with the help from Charlie. The computers in MCR are working. Both RHIC rings quenched. Cryo has lost control and readback data from several systems.

Cryogenics Log: At 10:49 MCR lost server, we had to put all lead flows into man and set for tare flow. Lost recoolers and circ pump flow dropped below limit. server reset and system recovering from quench. All flow controllers back in auto. -yatauro 13:24 Called MCR told them everything is good here and that they could ramp. -yatauro 14:25 Alarms: looks like a quench in Blue 8/9. Temps are up and the circ flow dropped to 20 -yatauro 18:05 System stable, other then the server going down, everything else running fine. -yatauro

Technical Notes / Sequence of Events: There was enough data that clearly shows that lead faults on the snakes in sector 3 quenched both blue and yellow snakes. The warm gas form these snake quenches quenched the main bus for both blue and yellow rings. Data also shows that the lead flow was increased for a short time before it went to a low level.

This is what I believed happened. The lead current data from the Cryo server went down. The lead flow automatically goes to a high flow default value. The Cryo operators then brought the lead flow to a low value. This was in their Cryo e-log. This is what caused the snakes to have a lead fault. They should not have done this with current in the magnet. Some how the Cryo operators did not know the machine was a top energy and or MCR did not know it either. George Ganetis

Y3QDQ8_VT, Yellow Sector 3, Quad 8 Buss Quenched.

Yo1-qf2-ps standby during On checks, retry and it worked.
QLI Recovery TAPE Start: **13:25:23** Link Recovered Time: **13:34:07** Estimated Down Time: **135** minutes

Quench Analysis: Cryo Induced Quench, Sector 3C, Warm Gas Flow causes Buss Quench
(Counter = Cryo Induced Quench)

Sunday-June 12, 2005: PR-150, Blue Quench: File# = 1118589825

Permit ID: **4b-time.A** Timestamp: **11:23:44 +1915820** Beam Permit Fail Timestamp: **11:18:52 +3979201**
(3b-ps1 in the PINK = Loss of Communication)
QPAControl / Timing Resolver: No faults indicated, Blue Quench Detector first to trip.
Quench Detector(s) Trip: 4b-qd1, B3QFBU9_7VT, Int. 5, Tq –22
12a-qd1, B11QFQ3_VT, Int. 1, Tq –22596990
5 Minute: Quench Delay File: None indicated, All Systems Running.
DX Heaters: No Postmortem / Snapshot Data Available.
5 Minute: Quench Delay File: None Initiated, all systems running.
Beam Loss Monitors (Rads/Hr): No Postmortem / Snapshot Data Available.
Main Magnet Power Status: At Store Energy, tripping at: BDMC = 1946.36 amps, BQMC = 1873.99 amps

B3QFBU9_7VT, Blue Sector 3, Quad Buss Quenched.

Bi9-tq6-ps standby during On checks, retry and it worked.
QLI Recovery TAPE Start: **13:25:21** Link Recovered Time: **13:34:02** Estimated Down Time: **130** minutes

RHIC Physics fy05 Run
Daily Quench Analysis for the month of June 2005

Quench Analysis: Cryo Induced Quench, Sector 3C, Warm Gas Flow causes Buss Quench
(Counter = Cryo Induced Quench)

***Tuesday-June 14, 2005*: PR-151, Yellow Quench: File# = 1118730889**
Permit ID: **8b-ps1** Timestamp: **02:34:48 +1434965** Beam Permit Fail Timestamp: **02:34:48 +1263722**
QPAControl / Timing Resolver: No faults indicated, yellow quench detector tripped first.
Quench Detector(s) Trip: 8b-qd2, Y8QFQ2_VT, Int. 5, Tq –24
5 Minute: Quench Delay File: 8b-qd2, Y8QFQ2_VT
Beam Loss Monitors (Rads/Hr): A steady increase of loss begins near T = minus 4 seconds, creating the most significant medium to high losses at the following: y8-lm0 = 1270.27, g8-lm1 = 2214.77, y8-lm2.1 = 15717.12, b8-lm2.1 = 13351.61, b8-lm3.2 = 607.91. Medium losses Continued to Sector 7 y7-lm2.1 = 1381.25 and b7-lm2.1 = 1493.69
Main Magnet Power Status: at store energy, YDMC = 1946.415 amps, YQMC = 1877.014 amps

Technical Notes / Sequence of Events: Postmortems: yo8-qd1, yo8-qf2 and yo8-qd3 all show the Laws of a Real Magnet Quenching. The 8b-qd2-quench detector caused the Yellow quench link to trip. The quench detector tripped because of a real magnet quench at Y8QFQ2_VT. The beam permit tripped prior to the quench link. There was one real magnet quench in the Sector 8 Triplet Region at magnet y8q2. Highest beam losses occurred at y8-lm2.1. There was no indication of a power supply fault. There are now 36 beam induced quenches for the Fy05 Run -Gregg Heppner [rhic] [quench]

Physics / MCR Logs: 02:30:00 Ramping RHIC in 84-bunch mode. 02:35, Oooops. So much for being optimistic, this happened as we were reaching flattop. -TJS, JLN, BSB, JAK

Cryogenics Log: 02:47 Quench- 8 Yellow, cryo permissive interlock. Minor heat from quench only took a few minutes to recover. -E.V

QLI Recovery TAPE Start: **02:47:25** Link Recovered Time: **02:59:40** Estimated Down Time: **25** minutes
Quench Analysis: Beam Induced Quench #036 (Counter = Beam Induced)

***Tuesday-June 14, 2005*: PR-152, Yellow Quench: File# = 1118745586**
Permit ID: **10a-ps3.A** Timestamp: **06:39:44 +2721189** Beam Permit Fail Timestamp: **06:39:44 +2721190**
QPAControl / Timing Resolver: No faults indicated, QP08-R10AYQF1-yo9-qf6-qp first to trip.
Quench Detector(s) Trip: 10a-qd2, Y9QFQ2_VT, Int. 1 Tq +1632 (all others remained running)
5 Minute: Quench Delay File: None initiated, all systems running.
Beam Loss Monitors (Rads/Hr): No beam in the machine.
Main Magnet Power Status: at Zero Current.

Technical Notes / Sequence of Events: A wfgRefRange Error and CAS replaced the current regulator but then the supply indicated (yo9-qf6-ps, Stby-Error, AC Power, Standby, Local, Error signal, Quench, AC Phase). According to Don, CAS then swapped out the control card and the supply was then fine. *G. Heppner*

Physics / MCR Logs: 05:40:00 D. Bruno was contacted in reference to a WFG reference range error alarm for the yo9-qf6 supply. PSCompare shows that the current reference followed the WFG during the 84-bunch ramp, but not during this last ramp. D. Bruno reported that Support should replace the current regulator card. 06:26:00, The beam has been dumped by Operations. 06:34:00 Support is replacing the current regulator card for the yo9-qf6 supply. 06:43 Support has replaced the current regulator card for yo9-qf6 but we have to now wait to recover the quench link due to the 8 minute delay in the quench recovery process. -jak, bsb 07:00 yo9-qf6 won't come out of local. Support investigating. –JLN

Cryogenics Log: Nothing to report on.

QLI Recovery TAPE Start: **07:08:28** Link Recovered Time: **07:16:56** Estimated Down Time: **37** minutes
Quench Analysis: yo9-qf6-ps, Current Regulator Card Relays K1 and K2 Failed.

(Counter = IR Power Supply Fault)

***Friday-June 24, 2005*: PR-153, Yellow Quench: File# = 1119620731**
Permit ID: **2b-ps1**Timestamp: **09:45:28 +3943372** Beam Permit Fail Timestamp: **09:45:28 +3943373**
QPAControl / Timing Resolver: No faults indicated, Yellow Quench Detector first to trip.
Quench Detector(s) Trip: 2b-qd2 Main and Auxiliary in the Pink (Loss of Communication)
5 Minute: Quench Delay File: None initiated, all systems running.
Beam Loss Monitors (Rads/Hr): No beam in the machine.
Main Magnet Power Status: at Zero Current.

Technical Notes / Sequence of Events: Quench Detector 2b-qd2 was reset, bringing down the yellow link. See Physics / MCR Log info below for details. *G. Heppner*

Physics / MCR Logs: 09:45, we have to re-set a quench FEC. This requires to have the magnets sitting at zero. So, another 15 minutes delay. -Mei 09:58 Well, George needs an additional 8 minutes to collect the PM data. –Mei. 09:45, Beam Abort, 2b-ps1 dropped Yellow Quench -Sequencer 10:01 Quench link dropped due to cfe-2b-qd2 needing to be reset due to ping failure. -jak

Cryogenics Log: Nothing to report on.

QLI Recovery TAPE Start: **09:48:01** /Cancelled because new TAPE software prohibits recovery for 8 minute delay.
QLI Recovery TAPE Start: **09:54:15** /Cancelled due to qdprocess.4b-qd2 tripped.
QLI Recovery TAPE Start: **10:00:24** /Cancelled due to qdprocess.4b-qd2 tripped.

QLI Recovery TAPE Start: **10:02:57** Link Recovered Time: **10:10:36** Estimated Down Time: **26** minutes
Quench Analysis: Quench Detector 2b-qd2 required a reset
(Counter = Quench Detector)

***Friday-June 24, 2005*: PR-154, Blue Quench: File# = 1119637992**
Permit ID: **6b-ps1** Timestamp: **14:33:12 +180403** Beam Permit Fail Timestamp: **14:33:12 +180404**
QPAControl / Timing Resolver: No faults indicated, Blue Quench Detector tripped first.
Quench Detector(s) Trip: 6b-qd1, B6QFQ3_VT, Int. 5, Tq –24
DX Heaters: None fired.
5 Minute: Quench Delay File: 6b-qd1, B6QFQ3_VT
Beam Loss Monitors (Rads/Hr): A steady increase of loss begins near T = minus 5 seconds, creating the most significant high losses at the following: b6-lm2.2 = 6985.14, b6-lm3.1 = 4902.47, b6-lm3.2 = 35991.98, g6-lm-srt.w = 3305.37.
Main Magnet Power Status: Had just made it to Store and tripped at: BDMC = 1946.33, BQMC = 1877.54

Technical Notes / Sequence of Events: Postmortems: The following Magnets, bo6-qd1, bo6-qf2, bi5-qf3 and bi5-qd2 also show the Laws of a Real Magnet Quenching. The 6b-qd1-quench detector caused the Blue quench link to trip. The quench detector tripped because of a real magnet quench at B6QFQ3_VT. The beam permit tripped after the quench link. There was one real magnet quench in the Sector 6 Triplet Region at magnet b6q3. Highest beam losses occurred at b6-lm3.2. There was no indication of a power supply fault. There are now 37 beam induced quenches for the Fy05 Run -Gregg Heppner [rhic] [quench]

Physics / MCR Logs: End of the Run Testing.

Cryogenics Log: 14:43 Quench Link Interlock in Blue ring, no effect on refrigerator. Informed MCR that they could try to ramp up again. - jb

QLI Recovery TAPE Start: **14:48:51** Link Recovered Time: **15:01:43** Estimated Down Time: **29** minutes

Quench Analysis: Beam Induced Quench #037 (Counter = Beam Induced)

***Saturday-June 25, 2005:* SQ-012; Snake Quench Identified, 9C, File# SAT_K#06250505**
Beam Permit, Link Status, permit.9c-ps1 = 00:57:56 +3327646
Snake Quench Permit.3c-ps1 = 01:06:40 +2067063

Operating Currents Qdplots / Snapshot Trip Time:

Bi9-snk7-1.4-ps = 99.99 amps / Quench Time: 01:06:41.933
Bi9-snk7-2.3-ps = 323.29 amps / Quench Time: 01:06:42.005

Yo9-snk7-1.4-ps = 97.88 amps / Quench Time: 01:06:44.433
Yo9-snk7-2.3-ps = 324.10 amps / Quench Time: 01:06:45.266

Beam Loss Monitors (Rads/Hr): No beam in the machine at the time, end of the run.

Physics / MCR Logs: Nothing.

Cryogenics Log: Nothing.

Technical Notes / Sequence of Events: Beam had been aborted and all systems where run down in preparation for the summer shutdown of 2005. However, MCR had not ramped down the 9C Alcove Snake Magnets in Blue and Yellow but had initiated a Standby Command at Operating Current causing all four Magnets quench. Alarm Log indicated these magnets had quenched, Qdplots shows that there where real magnet quenches but there was no mention of this event in either the Physics Log or the Cryogenics Log. Guess everyone was excited that the end of the run was finally here. I consulted with George Ganetis and he also confirmed my analysis. Operations Error gets the final point for the Counters for the RHIC Physics Run 05. *G. Heppner*

TAPE Start: **Not Until RHIC Run 06** Last Snake to ON: N/A Estimated Down Time: **N/A** minutes
Quench Analysis: Operator Error, Alcove 9C not properly ramped down.
(Counter = Operator Error)

***Saturday-June 25, 2005:* PR-155, Blue Quench: File# = 1119676174**
Permit ID: **12a-ps1.A** Timestamp: **01:09:32 +2561869** Beam Permit Fail Timestamp: **00:57:56 + 3327630**
QPA Control / Timing Resolver: QP08-R12ABQF4-b12-q6-qp, first to trip, no faults indicated.
Quench Detector(s) Trip: 12a-qd1 Archive, B11QFQ2_VT, Int. 1, Tq = 1633
5 Minute: Quench Delay File: None Initiated.
Main Magnet Power Status: Zero Currents
DX Heaters: None fired.
Beam Loss Monitors (Rads/Hr): No Beam in the Machine.

QLI Recovery TAPE Start: **(FY05)** Link Recovered Time: **N/A** Estimated Down Time: **N/A** minutes
Quench Analysis: Summer 2004 Shutdown. (No Counters)

***Saturday-June 25, 2005:* PR-156, Yellow Quench: File# = 1119676204**
Permit ID: **12a-ps1.A** Timestamp: **01:10:04 +547484** Beam Permit Fail Timestamp: **00:57:56 + 3327630**
QPA Control / Timing Resolver: QP11-R12AD1-y12-dh0-qp first to trip, no faults.
Quench Detector(s) Trip: 12a-qd2 Archive, Y12DRD0_D0, Int. 1, Tq = 1130
5 Minute: Quench Delay File: Y11QFQ2_VT, Y4QFQ3_VT and Y5QFQ2_VT
Main Magnet Power Status: Zero Currents
Beam Loss Monitors (Rads/Hr): No Beam in the Machine.

QLI Recovery TAPE Start: **(FY05)** Link Recovered Time: **N/A** Estimated Down Time: **N/A** minutes
Quench Analysis: Summer 2004 Shutdown. (No Counters)

Technical Notes / Sequence of Events: End of the RHIC Physics Run 05! *G. Heppner*

Physics / MCR Logs: Jun-25-2005 01:00 Accelerator physics finished. Ramping RHIC and ATR supplies to zero; HP is heading to the control room for a key to survey the dumps. Mode switch for AGS cold snake work. Jun-25-2005 01:43 RHIC and ATR power supplies are off. HP has surveyed the dumps; RHIC to RA. Jun-25-2005 01:12 What a miracle! The machine is still intact after all these "horrible" things;) Truly enjoyed and See you next year!!! –Mei

Cryogenics Log: Jun-25-2005 01:45 As of now, RHIC Cryo system stable. Lowering pressure in the rings by closing down on H86A. As per Tony, bring the M-line down till there is 3.0atm up stream of the circ. Ref. balanced by making LHe into Dewar #1 -yatauro

Science Will Return
In

"RHIC RUN 06"